DEVELOPMENT OF A LONG-DURATION BIOTELEMETRY GEL FOR ECG SIGNAL DETECTION - PRELIMINARY STUDY

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Introduction: The analysis of bioelectrical signals has contributed to a better physiological monitoring of individuals. The products available on the market permit the acquisition of physiological signals for approximately 2h30min, as they are mainly developed for quick medical exams, like ECG performance. However, monitoring for a longer time period is necessary in many cases, such as athletes during heavy exercise, human physiology studies, and patients suffering from a range of different diseases. Objectives: To develop a new conductive gel formulation that allows the acquisition of cardiovascular physiological signals for 12 hours. Methods: Six conductive gel formulations were developed that were tested using the TEMIS system, which consists of a T-shirt with sensors connected to a mobile platform for data acquisition. The ECG signals were registered from healthy volunteers, comparing the new formulations with water and a commercial gel (Lectromed). The tests were performed on consecutive days during 12 hours during which the new gels, water and Lectromed gel were applied using the TEMIS system and registered on a tachogram. The signals obtained were analyzed using the FisioSinal program and the degree of reliability evaluated. Results and Discussion: Data analysis showed that gel number 1 presented a longer durability by maintaining the electrical properties for approximately 4h30min, which proved to be more effective than the commercially available gel. It was verified that the type, polymer concentration, and humectant employed influenced the conduction time of the gel. Furthermore, the findings demonstrated that silicone negatively interfered in the contact time. Conclusion: This preliminary study showed that the gel formulation 1 presented an improvement in relation to the commercial gel against which it was tested. However, the durability of 12h expected fromthe new gel formulations was not obtained, motivating continuation of this research.

Ethical approval
334/14